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PATENT
Attorney's Matter No. 6005-55924

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:
JONATHAN ZONANA, BETSY M. FERGUSON,
DENIS HEADON, and PAUL OVERBEEK
Application No. _____

Art Unit: _____

Filed: Herewith

For: HYPOHIDROTIC ECTODERMAL
DYSPLASIA GENES AND PROTEINS

Examiner: _____

Date: December 4, 2000

STATEMENT IN COMPLIANCE WITH 37 C.F.R. § 1.821(f)

TO THE COMMISSIONER FOR PATENTS
Washington, DC 20231

Sir:

In compliance with 37 C.F.R. § 1.821(f), the undersigned declares that the nucleotide and/or amino acid sequences presented in the paper copy of the "Sequence Listing" submitted herewith are the same as the sequences contained in the computer-readable form of said "Sequence Listing." No new matter has been added.

Respectfully submitted,

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SEQUENCE LISTING

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<120> Hypohydrotic ectodermal dysplasia genes and proteins

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gccagcttct tttgttttgt tttgttttgt ttttccctac ccaaatatta ttgaaaaact 720
gtgaaaaaga ccctcccaca ccctgccatc tgattccctc ctgcagggcc tcaggcccct 780
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tgctcgcctt ctccgtagac ccatcttctg ctgggaaaag ctaacctcat tcgggtacca 240

ggtgtacttc caagagatc atg gcc cac gtc ggg gac tgc aaa tgg atg tcc 292
Met Ala His Val Gly Asp Cys Lys Trp Met Ser
1 5 10

tgg ctc cca gtg ctg gtg gtg tct ctg atg tgc tca gcc aag gcg gag 340
Trp Leu Pro Val Leu Val Val Ser Leu Met Cys Ser Ala Lys Ala Glu
15 20 25

gac tcc aac tgt ggt gag aac gaa tac cac aac cag act acc ggg ctg 388
Asp Ser Asn Cys Gly Glu Asn Glu Tyr His Asn Gln Thr Thr Gly Leu
30 35 40

tgc cag cag tgt cct cca tgc aga cca ggg gag gag ccc tac atg tcc 436
Cys Gln Gln Cys Pro Pro Cys Arg Pro Gly Glu Glu Pro Tyr Met Ser
45 50 55

tgt gga tac ggc act aaa gac gac gac tat ggc tgt gtg ccc tgc cct 484
Cys Gly Tyr Gly Thr Lys Asp Asp Asp Tyr Gly Cys Val Pro Cys Pro
60 65 70 75

gca gag aag ttc tcc aaa gga ggt tat cag ata tgc agg cgc cac aaa 532
Ala Glu Lys Phe Ser Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys
80 85 90

gac tgt gag ggc ttc ttc cgg gcc act gtg ctg aca cca gga gac atg 580
Asp Cys Glu Gly Phe Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met
95 100 105

gaa aac gac gct gag tgt ggc cca tgt ctc cct ggc tac tac atg ctg 628
Glu Asn Asp Ala Glu Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu
110 115 120

gaa aac aga ccc agg aac atc tat ggc atg gtc tgc tac tcc tgt ctc 676
Glu Asn Arg Pro Arg Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu
125 130 135

ttg gca cct ccc aac acc aag gaa tgt gtg gga gcc act tct ggg gtt 724
Leu Ala Pro Pro Asn Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Val
140 145 150 155

tca gca cac tca tcc agc act tcc ggt ggc agc acc ttg tct ccc ttc 772
Ser Ala His Ser Ser Ser Thr Ser Gly Gly Ser Thr Leu Ser Pro Phe
160 165 170

cag cat gct cac aaa gag ctc tca ggc caa gga cac ctg gcc acc gcc 820
Gln His Ala His Lys Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala
175 180 185

ctg att att gcc atg tct acg atc ttc atc atg gcc att gcc atc gtc 868

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Leu Ile Ile Ala Met Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val
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ctc atc atc atg ttc tac atc atg aag act aag ccg tca gct cca gcc   916
Leu Ile Ile Met Phe Tyr Ile Met Lys Thr Lys Pro Ser Ala Pro Ala
    205                 210                 215

tgc tgt agc agt ccc cca gga aag agc gca gaa gcc cca gct aac aca   964
Cys Cys Ser Ser Pro Pro Gly Lys Ser Ala Glu Ala Pro Ala Asn Thr
220                 225                 230                 235

cac gag gag aaa aaa gag gcc cca gac agt gtg gtg acg ttc cct gag   1012
His Glu Glu Lys Lys Glu Ala Pro Asp Ser Val Val Thr Phe Pro Glu
                240                 245                 250

aat ggt gag ttc cag aag ctg aca gca aca ccc aca aag acc ccc aaa   1060
Asn Gly Glu Phe Gln Lys Leu Thr Ala Thr Pro Thr Lys Thr Pro Lys
            255                 260                 265

agt gag aat gat gcc tcc tct gag aac gag cag ttg cta agt cgc agt   1108
Ser Glu Asn Asp Ala Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser
        270                 275                 280

gtg gac agt gat gaa gag cca gcc ccg gac aag cag ggg tcc cca gag   1156
Val Asp Ser Asp Glu Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu
    285                 290                 295

cta tgt ctg ctg tcg cta gtt cac ctg gcc agg gag aag tct gtg acc   1204
Leu Cys Leu Leu Ser Leu Val His Leu Ala Arg Glu Lys Ser Val Thr
300                 305                 310                 315

agt aac aag tct gct ggg atc cag agc cgg agg aaa aag ata ctg gat   1252
Ser Asn Lys Ser Ala Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp
                320                 325                 330

gtg tat gcc aac gtg tgt ggt gtt gtt gaa ggt ctc agc ccc acc gag   1300
Val Tyr Ala Asn Val Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu
            335                 340                 345

ttg ccg ttt gac tgc ctt gag aag aca agc cga atg ctc agc tct aca   1348
Leu Pro Phe Asp Cys Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr
        350                 355                 360

tac aac tct gag aag gcg gtc gtg aaa aca tgg cgc cac ctt gcc gag   1396
Tyr Asn Ser Glu Lys Ala Val Val Lys Thr Trp Arg His Leu Ala Glu
    365                 370                 375

agc ttt gga ctg aag agg gat gag att ggg ggc atg act gat ggc atg   1444
Ser Phe Gly Leu Lys Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met
380                 385                 390                 395

cag ctc ttt gac cgc atc agc acc gcg ggc tac agc atc cca gag ctg   1492
Gln Leu Phe Asp Arg Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu
                400                 405                 410

ctc aca aag ttg gtg cag atc gag cgg ctg gat gct gtg gag tcc ttg   1540
Leu Thr Lys Leu Val Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu
            415                 420                 425

tgt gca gac ata ttg gag tgg gct ggg gtt gta cca cct gcc tcc cca   1588
Cys Ala Asp Ile Leu Glu Trp Ala Gly Val Val Pro Pro Ala Ser Pro
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ccc cca gct gcg tcc tga agagttgtct tggactgtct tccctgggac          1636
Pro Pro Ala Ala Ser
    445

cagctgggga tccaatgaag tcacgaccga cagctgtgag tgatgctatc agactgccaa 1696

aactcaaggc atttcctggt gggtcactgt attccttagg ctgccctaag tagttcattg 1756

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tgtccagtca caagtgtggg cagatctggc ctccagcacc actcgcagcc acagcagtta 2236

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acttgctcag agtttgacca tgcctgattc ctgggtgagg ctcgagtgag ttcaggcaca 2356

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caaggcctga ggcagccagc atccttgttg tttcctagac tccctgcttg ctgctttagg 3376

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taaacaccca agctaggttt gagggcctga gccagtgaag ttttaattgt gaatatttta 3616

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<213> Mus musculus

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<400> 13

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Met Ala His Val Gly Asp Cys Lys Trp Met Ser Trp Leu Pro Val Leu
  1               5                  10                  15

gtg gtg tct ctg atg tgc tca gcc aag gcg gag gac tcc aac tgt ggt   96
Val Val Ser Leu Met Cys Ser Ala Lys Ala Glu Asp Ser Asn Cys Gly
             20                  25                  30

gag aac gaa tac cac aac cag act acc ggg ctg tgc cag cag tgt cct  144
Glu Asn Glu Tyr His Asn Gln Thr Thr Gly Leu Cys Gln Gln Cys Pro
         35                  40                  45

cca tgc aga cca ggg gag gag ccc tac atg tcc tgt gga tac ggc act  192
Pro Cys Arg Pro Gly Glu Glu Pro Tyr Met Ser Cys Gly Tyr Gly Thr
     50                  55                  60

aaa gac gac gac tat ggc tgt gtg ccc tgc cct gca gag aag ttc tcc  240
Lys Asp Asp Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu Lys Phe Ser
 65                  70                  75                  80

aaa gga ggt tat cag ata tgc agg cgc cac aaa gac tgt gag ggc ttc  288
Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys Glu Gly Phe
                 85                  90                  95

ttc cgg gcc act gtg ctg aca cca gga gac atg gaa aac gac gct gag  336
Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn Asp Ala Glu
            100                 105                 110

tgt ggc cca tgt ctc cct ggc tac tac atg ctg gaa aac aga ccc agg  384
Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn Arg Pro Arg
        115                 120                 125

aac atc tat ggc atg gtc tgc tac tcc tgt ctc ttg gca cct ccc aac  432
Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala Pro Pro Asn
    130                 135                 140
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acc aag gaa tgt gtg gga gcc act tct ggg gtt tca gca cac tca tcc   480
Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Val Ser Ala His Ser Ser
145                 150                 155                 160

agc act tcc ggt ggc agc acc ttg tct ccc ttc cag cat gct cac aaa   528
Ser Thr Ser Gly Gly Ser Thr Leu Ser Pro Phe Gln His Ala His Lys
                165                 170                 175

gag ctc tca ggc caa gga cac ctg gcc acc gcc ctg att att gcc atg   576
Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile Ile Ala Met
            180                 185                 190

tct acg atc ttc atc atg gcc att gcc atc gtc ctc atc atc atg ttc   624
Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile Ile Met Phe
        195                 200                 205

tac atc atg aag act aag ccg tca gct cca gcc tgc tgt agc agt ccc   672
Tyr Ile Met Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys Ser Ser Pro
    210                 215                 220

cca gga aag agc gca gaa gcc cca gct aac aca cac gag gag aaa aaa   720
Pro Gly Lys Ser Ala Glu Ala Pro Ala Asn Thr His Glu Glu Lys Lys
225                 230                 235                 240

gag gcc cca gac agt gtg gtg acg ttc cct gag aat ggt gag ttc cag   768
Glu Ala Pro Asp Ser Val Val Thr Phe Pro Glu Asn Gly Glu Phe Gln
                245                 250                 255

aag ctg aca gca aca ccc aca aag acc ccc aaa agt gag aat gat gcc   816
Lys Leu Thr Ala Thr Pro Thr Lys Thr Pro Lys Ser Glu Asn Asp Ala
            260                 265                 270

tcc tct gag aac gag cag ttg cta agt cgc agt gtg gac agt gat gaa   864
Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp Ser Asp Glu
        275                 280                 285

gag cca gcc ccg gac aag cag ggg tcc cca gag cta tgt ctg ctg tcg   912
Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys Leu Leu Ser
    290                 295                 300

cta gtt cac ctg gcc agg gag aag tct gtg acc agt aac aag tct gct   960
Leu Val His Leu Ala Arg Glu Lys Ser Val Thr Ser Asn Lys Ser Ala
305                 310                 315                 320

ggg atc cag agc cgg agg aaa aag ata ctg gat gtg tat gcc aac gtg   1008
Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr Ala Asn Val
                325                 330                 335

tgt ggt gtt gtt gaa ggt ctc agc ccc acc gag ttg ccg ttt gac tgc   1056
Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro Phe Asp Cys
            340                 345                 350

ctt gag aag aca agc cga atg ctc agc tct aca tac aac tct gag aag   1104
Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn Ser Glu Lys
        355                 360                 365

gcg gtc gtg aaa aca tgg cgc cac ctt gcc gag agc ttt gga ctg aag   1152
Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe Gly Leu Lys
    370                 375                 380
```

```
agg gat gag att ggg ggc atg act gat ggc atg cag ctc ttt gac cgc   1200
Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu Phe Asp Arg
385                 390                 395                 400

atc agc acc gcg ggc tac agc atc cca gag ctg ctc aca aag ttg gtg   1248
Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr Lys Leu Val
                405                 410                 415

cag atc gag cgg ctg gat gct gtg gag tcc ttg tgt gca gac ata ttg   1296
Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala Asp Ile Leu
            420                 425                 430

gag tgg gct ggg gtt gta cca cct gcc tcc cca ccc cca gct gcg tcc   1344
Glu Trp Ala Gly Val Val Pro Pro Ala Ser Pro Pro Pro Ala Ala Ser
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tga                                                               1347


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<212> DNA
<213> Homo sapiens

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Met Gly Tyr Pro Glu Val Glu Arg Arg Glu Leu Leu Pro Ala Ala Ala
  1               5                  10                  15

ccg cgg gag cga ggg agc cag ggc tgc ggg tgt ggc ggg gcc cct gcc    96
Pro Arg Glu Arg Gly Ser Gln Gly Cys Gly Cys Gly Gly Ala Pro Ala
             20                  25                  30

cgg gcg ggc gaa ggg aac agc tgc ctg ctc ttc ctg ggt ttc ttt ggc   144
Arg Ala Gly Glu Gly Asn Ser Cys Leu Leu Phe Leu Gly Phe Phe Gly
         35                  40                  45

ctc tcg ctg gcc ctc cac ctg ctg acg ttg tgc tgc tac cta gag ttg   192
Leu Ser Leu Ala Leu His Leu Leu Thr Leu Cys Cys Tyr Leu Glu Leu
     50                  55                  60

cgc tcg gag ttg cgg cgg gaa cgt gga gcc gag tcc cgc ctt ggc ggc   240
Arg Ser Glu Leu Arg Arg Glu Arg Gly Ala Glu Ser Arg Leu Gly Gly
 65                  70                  75                  80

tcg ggc acc cct ggc acc tct ggc acc cta agc agc ctc ggt ggc ctc   288
Ser Gly Thr Pro Gly Thr Ser Gly Thr Leu Ser Ser Leu Gly Gly Leu
                85                  90                  95

gac cct gac agc ccc atc acc agt cac ctt ggg cag ccg tca cct aag   336
Asp Pro Asp Ser Pro Ile Thr Ser His Leu Gly Gln Pro Ser Pro Lys
            100                 105                 110

cag cag cca ttg gaa ccg gga gaa gcc gca ctc cac tct gac tcc cag   384
Gln Gln Pro Leu Glu Pro Gly Glu Ala Ala Leu His Ser Asp Ser Gln
        115                 120                 125
```

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gac ggg cac cag atg gcc cta ttg aat ttc ttc ttc cct gat gaa aag   432
Asp Gly His Gln Met Ala Leu Leu Asn Phe Phe Phe Pro Asp Glu Lys
    130                 135                 140

cca tac tct gaa gaa gaa agt agg cgt gtt cgc cgc aat aaa aga agc   480
Pro Tyr Ser Glu Glu Glu Ser Arg Arg Val Arg Arg Asn Lys Arg Ser
145                 150                 155                 160

aaa agc aat gaa gga gca gat ggc cca gtt aaa aac aag aaa aag gga   528
Lys Ser Asn Glu Gly Ala Asp Gly Pro Val Lys Asn Lys Lys Lys Gly
                165                 170                 175

aag aaa gca gga cct cct gga ccc aat ggc cct cca gga ccc cca gga   576
Lys Lys Ala Gly Pro Pro Gly Pro Asn Gly Pro Pro Gly Pro Pro Gly
            180                 185                 190

cct cca gga ccc cag gga ccc cca gga att cca ggg att cct gga att   624
Pro Pro Gly Pro Gln Gly Pro Pro Gly Ile Pro Gly Ile Pro Gly Ile
        195                 200                 205

cca gga aca act gtt atg gga cca cct ggt cct cca ggt cct cct ggt   672
Pro Gly Thr Thr Val Met Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
    210                 215                 220

cct caa gga ccc cct ggc ctc cag gga cct tct ggt gct gct gat aaa   720
Pro Gln Gly Pro Pro Gly Leu Gln Gly Pro Ser Gly Ala Ala Asp Lys
225                 230                 235                 240

gct gga act cga gaa aac cag cca gct gtg gtg cat cta cag ggc caa   768
Ala Gly Thr Arg Glu Asn Gln Pro Ala Val Val His Leu Gln Gly Gln
                245                 250                 255

ggg tca gca att caa gtc aag aat gat ctt tca ggt gga gtg ctc aat   816
Gly Ser Ala Ile Gln Val Lys Asn Asp Leu Ser Gly Gly Val Leu Asn
            260                 265                 270

gac tgg tct cgc atc act atg aac ccc aag gtg ttt aag cta cat ccc   864
Asp Trp Ser Arg Ile Thr Met Asn Pro Lys Val Phe Lys Leu His Pro
        275                 280                 285

cgc agc ggg gag ctg gag gta ctg gtg gac ggc acc tac ttc atc tat   912
Arg Ser Gly Glu Leu Glu Val Leu Val Asp Gly Thr Tyr Phe Ile Tyr
    290                 295                 300

agt cag gta gaa gta tac tac atc aac ttc act gac ttt gcc agc tat   960
Ser Gln Val Glu Val Tyr Tyr Ile Asn Phe Thr Asp Phe Ala Ser Tyr
305                 310                 315                 320

gag gtg gtg gtg gat gag aag ccc ttc ctg cag tgc aca cgc agc atc   1008
Glu Val Val Val Asp Glu Lys Pro Phe Leu Gln Cys Thr Arg Ser Ile
                325                 330                 335

gag acg ggc aag acc aac tac aac act tgc tat acc gca ggc gtc tgc   1056
Glu Thr Gly Lys Thr Asn Tyr Asn Thr Cys Tyr Thr Ala Gly Val Cys
            340                 345                 350

ctc ctc aag gcc cgg cag aag atc gcc gtc aag atg gtg cac gct gac   1104
Leu Leu Lys Ala Arg Gln Lys Ile Ala Val Lys Met Val His Ala Asp
        355                 360                 365
```

```
atc tcc atc aac atg agc aag cac acc acg ttc ttt ggg gcc atc agg   1152
Ile Ser Ile Asn Met Ser Lys His Thr Thr Phe Phe Gly Ala Ile Arg
    370                 375                 380

ctg ggt gaa gcc cct gca tcc tag                                   1176
Leu Gly Glu Ala Pro Ala Ser
385                 390
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<212> DNA
<213> Mus musculus

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Met Gly Tyr Pro Glu Val Glu Arg Arg Glu Pro Leu Pro Ala Ala Ala
  1               5                  10                  15

cca agg gag cgg ggc agc cag ggc tgc ggc tgt cgc ggg gcc cct gct   96
Pro Arg Glu Arg Gly Ser Gln Gly Cys Gly Cys Arg Gly Ala Pro Ala
            20                  25                  30

cgg gcg ggc gaa ggg aac agc tgc cgg ctc ttc ctg ggt ttc ttt ggc   144
Arg Ala Gly Glu Gly Asn Ser Cys Arg Leu Phe Leu Gly Phe Phe Gly
        35                  40                  45

ctc tcg ctg gcc ctc cac ctg ctg acg ctg tgc tgc tac cta gag ttg   192
Leu Ser Leu Ala Leu His Leu Leu Thr Leu Cys Cys Tyr Leu Glu Leu
    50                  55                  60

cgg tcc gaa ttg cgg cgg gaa cgg gga acc gag tcc cgc ctc ggt ggc   240
Arg Ser Glu Leu Arg Arg Glu Arg Gly Thr Glu Ser Arg Leu Gly Gly
65                  70                  75                  80

ccg ggt gct cct ggc acc tct ggc acc cta agc agc cct ggg agc ctc   288
Pro Gly Ala Pro Gly Thr Ser Gly Thr Leu Ser Ser Pro Gly Ser Leu
                85                  90                  95

gac ccg gtg ggt ccc atc acc cgc cac ctg ggg cag ccg tcc ttt caa   336
Asp Pro Val Gly Pro Ile Thr Arg His Leu Gly Gln Pro Ser Phe Gln
            100                 105                 110

cag cag cct ttg gaa ccg gga gaa gat cca ctc ccc cct gag tcc cag   384
Gln Gln Pro Leu Glu Pro Gly Glu Asp Pro Leu Pro Pro Glu Ser Gln
        115                 120                 125

gac cgg cac cag atg gcc ctc ctg aat ttc ttc ttt cct gat gaa aag   432
Asp Arg His Gln Met Ala Leu Leu Asn Phe Phe Phe Pro Asp Glu Lys
    130                 135                 140

gca tat tct gaa gag gaa agt agg cgt gtt cgc cgc aat aag aga agc   480
Ala Tyr Ser Glu Glu Glu Ser Arg Arg Val Arg Arg Asn Lys Arg Ser
145                 150                 155                 160

aaa agt ggt gaa gga gca gat ggt cct gtt aaa aac aag aaa aag gga   528
Lys Ser Gly Glu Gly Ala Asp Gly Pro Val Lys Asn Lys Lys Lys Gly
```

```
                  165                 170                 175

aag aag gca ggg cca cct ggg ccc aac ggc ccc cca gga cct cca gga   576
Lys Lys Ala Gly Pro Pro Gly Pro Asn Gly Pro Pro Gly Pro Pro Gly
            180                 185                 190

cct ccg gga ccc cag gga cct cca ggg att cca gga att cct ggg att   624
Pro Pro Gly Pro Gln Gly Pro Pro Gly Ile Pro Gly Ile Pro Gly Ile
        195                 200                 205

cca gga aca act gtt atg gga cca cct ggc cca cct ggc cct cct ggt   672
Pro Gly Thr Thr Val Met Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
    210                 215                 220

cct caa gga ccc cct ggc ctc caa gga cct tct ggt gct gct gat aaa   720
Pro Gln Gly Pro Pro Gly Leu Gln Gly Pro Ser Gly Ala Ala Asp Lys
225                 230                 235                 240

act gga act cgg gaa aat cag cca gct gtg gtg cat ctg cag ggc caa   768
Thr Gly Thr Arg Glu Asn Gln Pro Ala Val Val His Leu Gln Gly Gln
                245                 250                 255

ggg tca gca att caa gtc aaa aat gat ctt tca ggt gga gtg ctc aat   816
Gly Ser Ala Ile Gln Val Lys Asn Asp Leu Ser Gly Gly Val Leu Asn
            260                 265                 270

gac tgg tct cgc atc act atg aac cct aag gtg ttt aaa cta cat ccc   864
Asp Trp Ser Arg Ile Thr Met Asn Pro Lys Val Phe Lys Leu His Pro
        275                 280                 285

cgc agc ggg gag ctg gag gtc tac tac atc aac ttc act gac ttt gcc   912
Arg Ser Gly Glu Leu Glu Val Tyr Tyr Ile Asn Phe Thr Asp Phe Ala
    290                 295                 300

agc tac gag gtg gtg gtg gat gag aag ccc ttc ctg cag tgc acc cgc   960
Ser Tyr Glu Val Val Val Asp Glu Lys Pro Phe Leu Gln Cys Thr Arg
305                 310                 315                 320

agc att gag aca ggg aag acc aac tac aac act tgc tat act gca ggc   1008
Ser Ile Glu Thr Gly Lys Thr Asn Tyr Asn Thr Cys Tyr Thr Ala Gly
                325                 330                 335

gtg tgc ctc ctc aag gcc agg cag aaa atc gcc gtg aag atg gtg cac   1056
Val Cys Leu Leu Lys Ala Arg Gln Lys Ile Ala Val Lys Met Val His
            340                 345                 350

gct gac atc tct atc aat atg agc aag cac acc acc ttc ttc ggg gcc   1104
Ala Asp Ile Ser Ile Asn Met Ser Lys His Thr Thr Phe Phe Gly Ala
        355                 360                 365

atc agg ctg ggc gaa gcc cct gca tcc tag                          1134
Ile Arg Leu Gly Glu Ala Pro Ala Ser
    370                 375
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<210> 16
<211> 1347
<212> DNA
<213> Homo sapiens

<220>

<221> CDS
<222> (1)..(1347)

<400> 16

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atg gcc cat gtg ggg gac tgc acg cag acg ccc tgg ctc ccc gtc ctg   48
Met Ala His Val Gly Asp Cys Thr Gln Thr Pro Trp Leu Pro Val Leu
  1               5                  10                  15

gtg gtg tct ctg atg tgc tca gcc cga gcg gaa tac tca aac tgc ggt   96
Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser Asn Cys Gly
             20                  25                  30

gag aac gag tac tac aac cag act acg ggg ctg tgc cag gag tgc ccc  144
Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln Glu Cys Pro
         35                  40                  45

ccg tgt ggg ccg gga gag gag ccc tac ctg tcc tgt ggc tac ggc acc  192
Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly Tyr Gly Thr
     50                  55                  60

aaa gac gag gac tac ggc tgc gtc ccc tgc ccg gcg gag aag ttt tcc  240
Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu Lys Phe Ser
 65                  70                  75                  80

aaa gga ggc tac cag ata tgc agg cgt cac aaa gac tgt gag ggc ttc  288
Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys Glu Gly Phe
                 85                  90                  95

ttc cgg gcc acc gtg ctg aca cca ggg gac atg gag aat gac gct gag  336
Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn Asp Ala Glu
            100                 105                 110

tgt ggc cct tgc ctc cct ggc tac tac atg ctg gag aac aga ccg agg  384
Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn Arg Pro Arg
        115                 120                 125

aac atc tat ggc atg gtc tgc tac tcc tgc ctc ctg gca ccc ccc aac  432
Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala Pro Pro Asn
    130                 135                 140

acc aag gaa tgt gtg gga gcc act tca gga gct tct gcc aac ttc cct  480
Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Ala Ser Ala Asn Phe Pro
145                 150                 155                 160

ggc acc tcg ggc agc agc acc ctg tct ccc ttc cag cac gcc cac aaa  528
Gly Thr Ser Gly Ser Ser Thr Leu Ser Pro Phe Gln His Ala His Lys
                165                 170                 175

gaa ctc tca ggc caa gga cac ctg gcc act gcc ctg atc att gca atg  576
Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile Ile Ala Met
            180                 185                 190

tcc acc atc ttc atc atg gcc atc gcc atc gtc ctc atc atc atg ttc  624
Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile Ile Met Phe
        195                 200                 205

tac atc ctg aag aca aag ccc tct gcc cca gcc tgt tgc acc agc cac  672
Tyr Ile Leu Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys Thr Ser His
    210                 215                 220

ccg ggg aag agc gtg gag gcc caa gtg agc aag gac gag gag aag aaa  720
```

```
Pro Gly Lys Ser Val Glu Ala Gln Val Ser Lys Asp Glu Glu Lys Lys
225                 230                 235                 240

gag gcc cca gac aac gtg gtg atg ttc tcc gag aag gat gaa ttt gag   768
Glu Ala Pro Asp Asn Val Val Met Phe Ser Glu Lys Asp Glu Phe Glu
                245                 250                 255

aag ctg aca gca act cca gca aag ccc acc aag agc gag aac gat gcc   816
Lys Leu Thr Ala Thr Pro Ala Lys Pro Thr Lys Ser Glu Asn Asp Ala
            260                 265                 270

tca tcc gag aat gag cag ctg ctg agc cgg agc gtc gac agt gat gag   864
Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp Ser Asp Glu
        275                 280                 285

gag ccc gcc cct gac aag cag ggc tcc ccg gag ctg tgc ctg ctg tcg   912
Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys Leu Leu Ser
    290                 295                 300

ctg gtt cac ctg gcc agg gag aag tct gcc acc agc aac aag tca gcc   960
Leu Val His Leu Ala Arg Glu Lys Ser Ala Thr Ser Asn Lys Ser Ala
305                 310                 315                 320

ggg att caa agc cgg agg aaa aag atc ctc gat gtg tat gcc aac gtg   1008
Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr Ala Asn Val
                325                 330                 335

tgt gga gtc gtg gaa ggt ctt agc ccc acg gag ctg cca ttt gat tgc   1056
Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro Phe Asp Cys
            340                 345                 350

ctc gag aag act agc cga atg ctc agc tcc acg tac aac tct gag aag   1104
Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn Ser Glu Lys
        355                 360                 365

gct gtt gtg aaa acg tgg cgc cac ctc gcc gag agc ttc ggc ctg aag   1152
Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe Gly Leu Lys
    370                 375                 380

agg gat gag att ggg ggc atg aca gac ggc atg caa ctc ttt gac cgc   1200
Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu Phe Asp Arg
385                 390                 395                 400

atc agc acg gca ggc tac agc atc cct gag cta ctc aca aaa ctg gtg   1248
Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr Lys Leu Val
                405                 410                 415

cag att gag cgg ctg gat gct gtg gag tcc ttg tgt gca gac ata ctg   1296
Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala Asp Ile Leu
            420                 425                 430

gag tgg gcg ggg gtt gtg cca cct gcc tcc cag cca cat gct gca tcc   1344
Glu Trp Ala Gly Val Val Pro Pro Ala Ser Gln Pro His Ala Ala Ser
        435                 440                 445

tga                                                               1347
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<210> 17
<211> 448

<212> PRT
<213> Homo sapiens

<400> 17

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Met Ala His Val Gly Asp Cys Thr Gln Thr Pro Trp Leu Pro Val Leu
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Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser Asn Cys Gly
             20                  25                  30
Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln Glu Cys Pro
         35                  40                  45
Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly Tyr Gly Thr
     50                  55                  60
Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu Lys Phe Ser
 65                  70                  75                  80
Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys Glu Gly Phe
                 85                  90                  95
Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn Asp Ala Glu
            100                 105                 110
Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn Arg Pro Arg
        115                 120                 125
Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala Pro Pro Asn
    130                 135                 140
Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Ala Ser Ala Asn Phe Pro
145                 150                 155                 160
Gly Thr Ser Gly Ser Ser Thr Leu Ser Pro Phe Gln His Ala His Lys
                165                 170                 175
Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile Ile Ala Met
            180                 185                 190
Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile Ile Met Phe
        195                 200                 205
Tyr Ile Leu Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys Thr Ser His
    210                 215                 220
Pro Gly Lys Ser Val Glu Ala Gln Val Ser Lys Asp Glu Glu Lys Lys
225                 230                 235                 240
Glu Ala Pro Asp Asn Val Val Met Phe Ser Glu Lys Asp Glu Phe Glu
                245                 250                 255
Lys Leu Thr Ala Thr Pro Ala Lys Pro Thr Lys Ser Glu Asn Asp Ala
            260                 265                 270
Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp Ser Asp Glu
        275                 280                 285
Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys Leu Leu Ser
    290                 295                 300
Leu Val His Leu Ala Arg Glu Lys Ser Ala Thr Ser Asn Lys Ser Ala
305                 310                 315                 320
Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr Ala Asn Val
                325                 330                 335
Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro Phe Asp Cys
            340                 345                 350
Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn Ser Glu Lys
        355                 360                 365
Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe Gly Leu Lys
    370                 375                 380
Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu Phe Asp Arg
385                 390                 395                 400
Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr Lys Leu Val
                405                 410                 415
Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala Asp Ile Leu
            420                 425                 430
Glu Trp Ala Gly Val Val Pro Pro Ala Ser Gln Pro His Ala Ala Ser
        435                 440                 445
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<210> 18
<211> 4235
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (433)..(1779)

<400> 18
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cccgctccag cctctccagt gctgggagag acctctagat ggtgcaggtg agtttgcaat 120

gagggaaagc ccctcggcaa ggactgagtt tccaaacttg cagacagggc agggagcggt 180

caaggaagag ttcccgggaa gccctttaaa cggaaaggaa gcggggctag tgtcagagag 240

gtgtgccagg tcccaggcag ccctgctgac ccctaaggac atagagtacc tgcttctgag 300

agggctgcca cggtggccac ctgtgaagcc tgtcacccag aactggatgg tacctgactt 360

tcttcataga cccatcttct gctgggactg aagctgacct ccaacagaag ccaggtgagc 420

ccttgggaga gg atg gcc cat gtg ggg gac tgc acg cag acg ccc tgg ctc 471
Met Ala His Val Gly Asp Cys Thr Gln Thr Pro Trp Leu
1 5 10

ccc gtc ctg gtg gtg tct ctg atg tgc tca gcc cga gcg gaa tac tca 519
Pro Val Leu Val Val Ser Leu Met Cys Ser Ala Arg Ala Glu Tyr Ser
15 20 25

aac tgc ggt gag aac gag tac tac aac cag act acg ggg ctg tgc cag 567
Asn Cys Gly Glu Asn Glu Tyr Tyr Asn Gln Thr Thr Gly Leu Cys Gln
30 35 40 45

gag tgc ccc ccg tgt ggg ccg gga gag gag ccc tac ctg tcc tgt ggc 615
Glu Cys Pro Pro Cys Gly Pro Gly Glu Glu Pro Tyr Leu Ser Cys Gly
50 55 60

tac ggc acc aaa gac gag gac tac ggc tgc gtc ccc tgc ccg gcg gag 663
Tyr Gly Thr Lys Asp Glu Asp Tyr Gly Cys Val Pro Cys Pro Ala Glu
65 70 75

aag ttt tcc aaa gga ggc tac cag ata tgc agg cgt cac aaa gac tgt 711
Lys Phe Ser Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys
80 85 90

gag ggc ttc ttc cgg gcc acc gtg ctg aca cca ggg gac atg gag aat 759
Glu Gly Phe Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn
95 100 105

gac gct gag tgt ggc cct tgc ctc cct ggc tac tac atg ctg gag aac 807
Asp Ala Glu Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn
110 115 120 125

aga ccg agg aac atc tat ggc atg gtc tgc tac tcc tgc ctc ctg gca 855
Arg Pro Arg Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala
130 135 140

```
ccc ccc aac acc aag gaa tgt gtg gga gcc act tca gga gct tct gcc   903
Pro Pro Asn Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Ala Ser Ala
            145                 150                 155

aac ttc cct ggc acc tcg ggc agc agc acc ctg tct ccc ttc cag cac   951
Asn Phe Pro Gly Thr Ser Gly Ser Ser Thr Leu Ser Pro Phe Gln His
        160                 165                 170

gcc cac aaa gaa ctc tca ggc caa gga cac ctg gcc act gcc ctg atc   999
Ala His Lys Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile
    175                 180                 185

att gca atg tcc acc atc ttc atc atg gcc atc gcc atc gtc ctc atc   1047
Ile Ala Met Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile
190                 195                 200                 205

atc atg ttc tac atc ctg aag aca aag ccc tct gcc cca gcc tgt tgc   1095
Ile Met Phe Tyr Ile Leu Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys
                210                 215                 220

acc agc cac ccg ggg aag agc gtg gag gcc caa gtg agc aag gac gag   1143
Thr Ser His Pro Gly Lys Ser Val Glu Ala Gln Val Ser Lys Asp Glu
            225                 230                 235

gag aag aaa gag gcc cca gac aac gtg gtg atg ttc tcc gag aag gat   1191
Glu Lys Lys Glu Ala Pro Asp Asn Val Val Met Phe Ser Glu Lys Asp
        240                 245                 250

gaa ttt gag aag ctg aca gca act cca gca aag ccc acc aag agc gag   1239
Glu Phe Glu Lys Leu Thr Ala Thr Pro Ala Lys Pro Thr Lys Ser Glu
    255                 260                 265

aac gat gcc tca tcc gag aat gag cag ctg ctg agc cgg agc gtc gac   1287
Asn Asp Ala Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp
270                 275                 280                 285

agt gat gag gag ccc gcc cct gac aag cag ggc tcc ccg gag ctg tgc   1335
Ser Asp Glu Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys
                290                 295                 300

ctg ctg tcg ctg gtt cac ctg gcc agg gag aag tct gcc acc agc aac   1383
Leu Leu Ser Leu Val His Leu Ala Arg Glu Lys Ser Ala Thr Ser Asn
            305                 310                 315

aag tca gcc ggg att caa agc cgg agg aaa aag atc ctc gat gtg tat   1431
Lys Ser Ala Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr
        320                 325                 330

gcc aac gtg tgt gga gtc gtg gaa ggt ctt agc ccc acg gag ctg cca   1479
Ala Asn Val Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro
    335                 340                 345

ttt gat tgc ctc gag aag act agc cga atg ctc agc tcc acg tac aac   1527
Phe Asp Cys Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn
350                 355                 360                 365

tct gag aag gct gtt gtg aaa acg tgg cgc cac ctc gcc gag agc ttc   1575
Ser Glu Lys Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe
                370                 375                 380
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```
ggc ctg aag agg gat gag att ggg ggc atg aca gac ggc atg caa ctc   1623
Gly Leu Lys Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu
            385                 390                 395

ttt gac cgc atc agc acg gca ggc tac agc atc cct gag cta ctc aca   1671
Phe Asp Arg Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr
        400                 405                 410

aaa ctg gtg cag att gag cgg ctg gat gct gtg gag tcc ttg tgt gca   1719
Lys Leu Val Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala
    415                 420                 425

gac ata ctg gag tgg gcg ggg gtt gtg cca cct gcc tcc cag cca cat   1767
Asp Ile Leu Glu Trp Ala Gly Val Val Pro Pro Ala Ser Gln Pro His
430                 435                 440                 445

gct gca tcc tga aaagcatgcc tgtgggctgt cctcccagga caagccaagg       1819
Ala Ala Ser

atccaacgag ggctctggag ctgtgagtgg tgccaaaaga ctgccaagaa tcaaggcttt 1879

tgtgatatgt caccgtatgc cttaggatgt tcaaggagcc agacgaaata aggcctgtct 1939

tccaatttaa ccaaagataa aggactagag ccgggatact ttcagatgct cgcctgtacc 1999

tcaccaggca gagtaaatat ctactcactc atacagccag cccaccagcc caccattaac 2059

tcactgaaca atgagacaat gttgaggact caaatgaatc aaaccccgtg ggaatgacag 2119

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cgtatgttta caaaccactt cactggaaga cgtcaaacaa gctgaatgaa ggggcgctta 2239

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cataattcta gatttcaaga gcatctaaga cttgtggatt agcctcatgg catgagagtt 2839

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tgggcttggt gtcgagggag ctggcttcta gttgtgccac cttgggcctt gtcttttcct 2959

ctctctgcct cagtttctcg tctgccaatg agatgttagt tagtgattct ataattgggg 3019

caggtagggt tcaggtgagc aaaaagaaag tggagctata ggaaatgcca ggcctttgag 3079
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gtgctctatg gaagtcaaca cagtgtggtt tgtccattta aatgggaata aaaacagaaa 3139

aactcagact tggcattttc acaataactg caatggtttg acataacatt tataggcaga 3199

aagttaataa actggcattg ttcttggcat attattgtac tatccctgta actgccaaga 3259

gctcaggagc caggctagtg atcacaccag gggttagagt tcactgctga actccctgat 3319

ggcaggtctg tgtttattac tacattaaaa caaagtctct gacttataaa gcgaggtcgt 3379

aaaaattaca agttgcatga ctgaaaaaat gctttagggg gaaaatcagt catatcttta 3439

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ctttgaaatc ctgtggtgcc cccttccccc tgccttgtga tgatgatgag tgagtctccc 3679

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ccctcctcag aatgttttca gcgaaagagt ggggtggctg ttctctgctc ctggtgcttt 3799

ggcctcattt cacactatta gaattctggg gctgtaaggc cagccagtgt cagctcatgt 3859

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ggattcagaa caatgagatc ataataattc tcactgacca aagctgggac tccatcctgc 4039

cattttgtg tggagatatt cataattctg caatacttta aaacatttag aaaacacccc 4099

agggtaggtc tgtggccctt agacagtgaa gtcttaattg tcaatattat ttttgtctaa 4159

ttctgtatat atataactta ttatatttta taatctcaat aaacacatta ataaaaaaaa 4219

aaaaaaaaaa aaaaaa 4235

<210> 19
<211> 448
<212> PRT
<213> Mus musculus

<400> 19

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Val	Val	Ser	Leu	Met	Cys	Ser	Ala	Lys	Ala	Glu	Asp	Ser	Asn	Cys	Gly
			20					25				30			
Glu	Asn	Glu	Tyr	His	Asn	Gln	Thr	Thr	Gly	Leu	Cys	Gln	Gln	Cys	Pro
		35					40					45			
Pro	Cys	Arg	Pro	Gly	Glu	Glu	Pro	Tyr	Met	Ser	Cys	Gly	Tyr	Gly	Thr
	50					55					60				
Lys	Asp	Asp	Asp	Tyr	Gly	Cys	Val	Pro	Cys	Pro	Ala	Glu	Lys	Phe	Ser
65					70					75					80

Lys Gly Gly Tyr Gln Ile Cys Arg Arg His Lys Asp Cys Glu Gly Phe
85 90 95

Phe Arg Ala Thr Val Leu Thr Pro Gly Asp Met Glu Asn Asp Ala Glu
100 105 110

Cys Gly Pro Cys Leu Pro Gly Tyr Tyr Met Leu Glu Asn Arg Pro Arg
115 120 125

Asn Ile Tyr Gly Met Val Cys Tyr Ser Cys Leu Leu Ala Pro Pro Asn
130 135 140

Thr Lys Glu Cys Val Gly Ala Thr Ser Gly Val Ser Ala His Ser Ser
145 150 155 160

Ser Thr Ser Gly Gly Ser Thr Leu Ser Pro Phe Gln His Ala His Lys
165 170 175

Glu Leu Ser Gly Gln Gly His Leu Ala Thr Ala Leu Ile Ile Ala Met
180 185 190

Ser Thr Ile Phe Ile Met Ala Ile Ala Ile Val Leu Ile Ile Met Phe
195 200 205

Tyr Ile Met Lys Thr Lys Pro Ser Ala Pro Ala Cys Cys Ser Ser Pro
210 215 220

Pro Gly Lys Ser Ala Glu Ala Pro Ala Asn Thr His Glu Glu Lys Lys
225 230 235 240

Glu Ala Pro Asp Ser Val Val Thr Phe Pro Glu Asn Gly Glu Phe Gln
245 250 255

Lys Leu Thr Ala Thr Pro Thr Lys Thr Pro Lys Ser Glu Asn Asp Ala
260 265 270

Ser Ser Glu Asn Glu Gln Leu Leu Ser Arg Ser Val Asp Ser Asp Glu
275 280 285

Glu Pro Ala Pro Asp Lys Gln Gly Ser Pro Glu Leu Cys Leu Leu Ser
290 295 300

Leu Val His Leu Ala Arg Glu Lys Ser Val Thr Ser Asn Lys Ser Ala
305 310 315 320

Gly Ile Gln Ser Arg Arg Lys Lys Ile Leu Asp Val Tyr Ala Asn Val
325 330 335

Cys Gly Val Val Glu Gly Leu Ser Pro Thr Glu Leu Pro Phe Asp Cys
340 345 350

Leu Glu Lys Thr Ser Arg Met Leu Ser Ser Thr Tyr Asn Ser Glu Lys
355 360 365

Ala Val Val Lys Thr Trp Arg His Leu Ala Glu Ser Phe Gly Leu Lys
370 375 380

Arg Asp Glu Ile Gly Gly Met Thr Asp Gly Met Gln Leu Phe Asp Arg
385 390 395 400

Ile Ser Thr Ala Gly Tyr Ser Ile Pro Glu Leu Leu Thr Lys Leu Val
405 410 415

Gln Ile Glu Arg Leu Asp Ala Val Glu Ser Leu Cys Ala Asp Ile Leu
420 425 430

Glu Trp Ala Gly Val Val Pro Pro Ala Ser Pro Pro Pro Ala Ala Ser
435 440 445

<210> 20
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to amplify exon 5 of
EDA1-II.

<400> 20
agaaagcagg acctcctgg 19

<210> 21
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to amplify exon 5 of
EDA1-II.

<400> 21
ctctcaggat cacccactc 19

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 22
tatgttggct atgactgact gagtgg 26

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 23
ccctaccaag aaggtagttc 20

<210> 24
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
ciagnose ED.

<400> 24
ctctcaggat cacccactcc tg 22

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 25
tgtcaattca ccacagggag 20

<210> 26
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 26
gaatctagga tgcaggggc 19

<210> 27
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnose ED.

<400> 27
tattgcggcg aacacg 16

<210> 28
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnos ED.

<400> 28
tattgcagcg aacacg 16

<210> 29
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnos ED.

<400> 29
tattgcggca aaacacg 17

<210> 30
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 30
atcatggctg tgcactctag 20

<210> 31
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC
library.

<400> 31
acctactgca tgtctgtgga 20

<210> 32
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC library.

<400> 32
cacatgctca gtgttgtcca 20

<210> 33
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to screen a BAC library.

<400> 33
acacaggctc agtcatgcgg 20

<210> 34
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 34
gcggtgaccc gggagatctg aattc 25

<210> 35
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 35
gaattcagat c 11

<210> 36
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 36
ctgagcggaa ttcgtgagac c 21

<210> 37
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 37
ggtctcacga attccgctca gtt 23

<210> 38
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 38
agtgagaatg atgcctcc 18

<210> 39
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 39
gcctttgttc agtcatagg 19

<210> 40
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 40
cctgagagct ctttgtgag 19

<210> 41

<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 41
cgggatcctc gagggggggg ggggggggh 29

<210> 42
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 42
aagcagagct ccacaatc 18

<210> 43
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 43
ggccgctctg gacaggatat gttttttttt ttttttttvn 39

<210> 44
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 44
ggaacagtca agagcgagtt 20

<210> 45
<211> 30
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide primers used to clone a murine dl gene.

<400> 45
gcggatccag gccgctctgg acaggatatg 30

<210> 46
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone human DL.

<400> 46
tggtgtctct gatgtgc 17

<210> 47
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone human DL.

<400> 47
acagtggccc ggaagaag 18

<210> 48
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone human DL.

<400> 48
ctgcggtgag aacgagtac 19

<210> 49
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone human DL.

<400> 49

ggcaaggtgg cgccatgt 18

<210> 50
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 50
ggcaccaaag acgaggacta 20

<210> 51
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 51
tcagcgtcat tctccatgtc 20

<210> 52
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 52
ctagactcga gaattcgcgg ccgcactagt ttttttttt ttttt 46

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 53
tctggtagcc tcctttggaa 20

<210> 54
<211> 17

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 54
ctagactcga gaattcg 17

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 55
tagtcctcgt ctttggtgcc 20

<210> 56
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 56
gagaattcgc ggccgcac 18

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 57
agccccgtag tctggttgta 20

<210> 58
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:

Oligonucleotide primers that were used to clone human DL.

<400> 58
gcgtcgacag tgatgagga 19

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.

<400> 59
cagtcttttg gcaccactca 20

<210> 60
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.

<400> 60
acgtgtgtgg agtcgtgga 19

<210> 61
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.

<400> 61
ctcgttggat ccttggctt 19

<210> 62
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Oligonucleotide primers that were used to clone human DL.

<400> 62
tacatgctgg agaacagacc 20

<210> 63
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 63
ttccaaagga ggctaccaga 20

<210> 64
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 64
ttggcagaag ctcctgaagt 20

<210> 65
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 65
tgctcgagat gtgatgaagg 20

<210> 66
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 66
aagcagatgg ccacagaact 20

<210> 67
<211> 19
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 67
ggagaggatg gcccatgtg 19

<210> 68
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 68
cagaccatgc catagatgtt c 21

<210> 69
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 69
acttcaggag cttctgccaa 20

<210> 70
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 70
tcgtccttgc tcacttggg 19

<210> 71
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone

human DL.

<400> 71
ggatgaattt gagaagctga c 21

<210> 72
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 72
ctgacttgtt cgtggtggc 19

<210> 73
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that were used to clone
human DL.

<400> 73
tccacgactc cacacacgt 19

<210> 74
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 74
aaataaaggt agccagaccc 20

<210> 75
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 75
gtaaggggct cagaccact 19

<210> 76
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 76
catgtgtttc taaggaggta c 21

<210> 77
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 77
caacaatgcc acaagcagga 20

<210> 78
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 78
gtccgtatgg tttggctgc 19

<210> 79
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 79
gccagggttt gccaggag 18

<210> 80
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 80
gtccagctca cctgtctct 19

<210> 81
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 81
accggctctt tcctacacc 19

<210> 82
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 82
tggagcttct ctggatcatt t 21

<210> 83
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 83
aactccaggt gatcgatacc 20

<210> 84
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 84
ctgggtcatt catgccttct 20

<210> 85
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 85
atggtgtgtg gaagccctg 19

<210> 86
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 86
catgagccaa ttctaactcc t 21

<210> 87
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 87
caggacccca gttcagctt 19

<210> 88
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 88
cccaggcact gctaatgac 19

<210> 89
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 89
ccacatctca cagctcatca 20

<210> 90
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 90
tttctactgt tgccccttc t 21

<210> 91
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 91
cccagccctt catgtcagt 19

<210> 92
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 92
tctattgact gtgacttgca 20

<210> 93
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used for
mutation screening of human DL.

<400> 93
ctcgttggat ccttggctt 19

<210> 94
<211> 425
<212> DNA
<213> Homo sapiens

<400> 94
ttttttttt tgggggcaga cggccgaaga gccaggtgtg ccaaggtcat atggcagcag 60
ggctgaacgt gcccgctcca gcctctccag tgctggaaga gacctctaga tggagcaggt 120
gagtttgcaa ttagggaaag cccctcggca aggactgagt ttccaaactt gcagacaggg 180
cagggagcgg tcaaggaaga gttcccggga agccctttaa acggaaagga agcggggcta 240
gtgtcagaga ggtgtgacag gtcccagtca gccctgctgg cccctaagga catagagtac 300
ctgcttctga gagggctgcc acggtggcca cctgtgaagc ctgtcaccca gaactggatg 360
gtacctgact ttcttcatag acccatcttc tgctgggact gaagctgacc tccaacagaa 420
gccag 425

<210> 95
<211> 434
<212> DNA
<213> Homo sapiens

<400> 95
gtaagccctg gtcctttcct ctggttttct aaactcttca gctgtggccg agacggaggt 60
gtcatgggct gggagagagg ctgggtgcat ttttgaaatg catgtcattt ttgggttgcg 120
tttgaaggtt tcnccaaacc ctctgagcac gagaaacaca atcactancc tcgggtttaa 180
ccttgggccc tccgtgtgct cctagcctcc tntcaggctc cctcccaggc atggctgcna 240
ggctgggaag gccccagagt cagcccaagt ggcatgggtn cagcttcagc ttcatgtctg 300
cttttctttt aggatgtata gtttcccctc tgtttgctgg aaggcacctt atatccagtg 360
gggttaaata aaggtagcca gacccccggc tggggtgcta ccgccagtgc ccagctaatg 420
acgcatnnnt tcag 434

<210> 96
<211> 70
<212> DNA
<213> Homo sapiens

<400> 96
gtgagcccct tgggagagga tggcccatgt gggggactgc acgcagacgc cctggctccc 60
cgtcctggtg 70

<210> 97
<211> 722
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(722)
<223> n represents a, c, t or g.

<400> 97
gtaagtggtc tgagcccctt acccccacag caccctcatc ctcatgatgg ttggactgtt 60
tcttggcctc ttcagctgta aaatgggaat gctgatcata gtccctcctc cacagggttc 120
ttctgagggt gaaatgaaac caggcctgca aagcacagaa ctctgcccca ggctgaagtt 180
acattgattt cgttggtagc tcccttcata gggtctcatg gatataaacg ttcttgattg 240
cttgtttgtg gtgtgataca cacagccctg tgtctatgtg atgagctcat gcttgggggc 300
cgcgcagcta agaaagactt ggaagactca gacccctacc cccatcctcc tggacacgcc 360
ggtgttctga ggagccactg tattagaggc tcagtggggg acaggggcgc ctcctccatg 420
accttggcaa gtgcgttgat gaggagaact canagcaggc cttgatggtg ggatggggct 480
tggccagcag gggtgaaggc agggtggttc tagtgggggc tggccgtgcc cangtggatc 540
aaccaggagc cactggagac ttaacagcag tgagcactna caagcggcac cttcccagac 600
cgagccccca gcagagcccc caccgcaggg cacccccttc ctatgtcaac cttggggtct 660
tgcaggagtc acatgtgttt ctaaggaggt acggaggcca caacaccccc ctttgttggc 720
ag 722

<210> 98
<211> 123
<212> DNA
<213> Homo sapiens

<400> 98
gtgtctctga tgtgctcagc ccgagcggaa tactcaaact gcggtgagaa cgagtactac 60
aaccagacta cggggctgtg ccaggagtgc cccccgtgtg ggccgggaga ggagccctac 120
ctg 123

<210> 99
<211> 740
<212> DNA
<213> Homo sapiens

<400> 99
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attgttgccc tgagcctgcc ttgctgtgtg aggggatgcc agggtatatc aaaccagccg 120
gtcacgctcc ctggacgttg agattgatgg caagagctgc cgtgagccca ggaatggcac 180
tcaccagcta agcattcata aacagatttt tcaggagttc tgaaatgttt ttaaaggatc 240
actttcccac tctaccctga ttaaatgagc gtcagatcat ctgattggaa gcaggattga 300
aatattctcc agtactagta cattttttcc tgagtgctgc atctccctcc gcctctgggc 360
aagctaagcc tgagtgttct gttcagcact aagggaaacc tccggggttt cagtgtccgg 420
ttcttgtagc aagctgagga aagtcagatg ccaagtgcta cctgcactgc ctgggcattc 480
cagcagctcg ctgaattcat ctcggggagg ctcagaaaag gggcagcatc tggagcctga 540
gagtggcgag gagaggggca agcccagagc atgagctggt tcctgggggg ttttgcagtt 600
aggacaactc aggaaaccaa ggcccggcaa gagtagcttc tggagacagc tggcacgtca 660
ctgcccaagg actgtgggcc gagtccgtat ggtttggctg ctgcactcac ctgtgtcccc 720
tgtcctcttt ccctggacag 740

<210> 100
<211> 182
<212> DNA
<213> Homo sapiens

<400> 100
tcctgtggct acggcaccaa agacgaggac tacggctgcg tcccctgccc ggcggagaag 60
ttttccaaag gaggctacca gatatgcagg cgtcacaaag actgtgaggg cttcttccgg 120
gccaccgtgc tgacaccagg ggacatggag aatgacgctg agtgtggccc ttgcctcccc 180
gg 182

<210> 101

<211> 1169
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(1169)
<223> n represents a, c, t, or g.

<400> 101
gtaagcacag gccctcctgg caaaccctgg catgctttct gcagaaaacc ccgaggggct 60
acgggcaagg accttgggaa caggggtcat ggatactgca ggcctcggtg cagccgcaca 120
cctggccttg gtcccatccc acaaggagca gcatccagga cggagagtcc tggcccctcc 180
ggtggacagg cagcccatca ggctctgcct ctgtgtctcc taagtggcca ttaaccatca 240
taatatcttc tgaccaccaa aaggaaacaa attgcttgaa tacttacagt gcagtagccc 300
atgtgaaaca ctttgggaaa aagaaaactn naatttnatg caaaaagcag tattttnagt 360
attctggnaa cactctggnn aanctactaa taannntanat ntgagaaaag aaatatnant 420
gangagatta tgannncgaa gnnaagnnan gnanaancan annaggntnn agaaaatgag 480
gttgnnaang antnataana tagnacanng ntgatatnca tnggaaagta aacngcntga 540
gnannagtga tttgtgatng ccagggtatt cntngaggga aaacangact attggancag 600
anngtgngga aaggnacaaa cgntgtntna ncataganaa nntagagttg ntgggtgggc 660
attnnaanna gcnggtaaag aatagcttgn aagtngncaa ggggtnccag aggcaannnt 720
aatgcctata natcccataa gnntgcaggc tantggngan ggtgctnaca aagagcatgt 780
tcctcctcca ggaaggtctg gccttngttg gtgtnacccc tgggggggcta ancaggccnt 840
acatgtgggg gcacagggat atttctggtg natgatgtga tggcacacac actaaacaca 900
gccaccagag agaggaacca gaaaggggct gagatcaaaa gaaaggccca cgttggcagc 960
tcaatattgt taaaagaatg ctccatttca agacaggctg aaaccccaag gaaactgagt 1020
ggacagagca ggtgactgag tgggcgtggc ctcatgcccg acttgattgt gggcctgcag 1080
actggccacc gtgctctctg caccagtccc tgcctgtgtg ctgtccagct cacctgtcta 1140
ctgttttgtc cttgtgctct ccnccgtag 1169

<210> 102
<211> 86
<212> DNA
<213> Homo sapiens

<400> 102
ctactacatg ctggagaaca gaccgaggaa catctatggc atggtctgct actcctgcct 60
cctggcaccc cccaacacca aggaat 86

<210> 103
<211> 484
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(484)
<223> n represents a, c, t, or g.

<400> 103
gtgagtgtct ttgtccttcc accagcacgg tatttgttca ggcacggatc tctttcacta 60
cagagggtgt aggaaagagc cggtcctggc acctggacaa ggtgaatcac agtaacagca 120
ctagtgaaag tgctcctgtg gcctgtccag gcaggtctat gaagggaggg gcgtttgcca 180
catctgagcc ttgagtcaga ggctgaggtt ctagtgcagg ttggccacca gctacctgac 240
aagtcactta acctccatga gcctcggttt tctcatcggt aatatggggg tgaagaaagn 300
acaatancga tgactcttta gggttcatta aacagtctaa gaaatacaaa tatttagctc 360
ccctcagcca tcactgcctc aggcccattc atgatcatga atccagatcc atgagctctg 420
tggcagcgtg ctttgaaggt ggagcttctc tggatcattt gagggactct attttgcctt 480

gcag 484

<210> 104
<211> 87
<212> DNA
<213> Homo sapiens

<400> 104
gtgtgggagc cacttcagga gcttctgcca acttccctgg cacctcgggc agcagcaccc 60
tgtctccctt ccagcacgcc cacaaag 87

<210> 105
<211> 799
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(799)
<223> n represents a, c, t, or g.

<400> 105
gtgaggaggg tgctcaggta tcgatcacct ggagttaggt ggtactcgga tgaaagctca 60
gaagaggaga ggaaatgatc atgagtgatg attatggtgc gcttccccac ctggcctcac 120
ctccctaatg taattgaatg acatgttgcc ccccgtgcag gaagtcatta tatctgcaat 180
cagagttgat ccctctatgg gtgtcctggg accgctggga ggtgctggtg gtgaaggcgg 240
gggcatagcg gcaggtggac agcacaggca gctgcaagcc cggccaggag gagagaccag 300
gcgtcctggg ctttggtttg gccgngagtt aacagcaatt ctatcactgg ttttcatata 360
aacatgctga ccatagcact ttaatattaa cttgcanaan gtncattttc attctncctt 420
aaccagggaa gangggatcg nggaggaccc caangtttan tntgcctctc acanttagnc 480
ccccacntgg cttgncntna aggttgccaa agcagtagna gcgagaagca agctccctta 540
ggaacaatna ggtanccccа gaaaaagtct gganaggcca agtctgaggg cagcgagcag 600
gggttgtggg cagtcctggt ctggcagcca aaaccagcgc gnaggatttg gttctcagtc 660
taagcaagca cctcagattt cagggttccc tgaaagcatc ccaggggcag ggccattgct 720
tccaggggcc ggagtcctgg agggaagacc agcagggatc ctgagctctg ggtcattcat 780
gccttctctc cacccacag 799

<210> 106
<211> 126
<212> DNA
<213> Homo sapiens

<400> 106
aactctcagg ccaaggacac ctggccactg ccctgatcat tgcaatgtcc accatcttca 60
tcatggccat cgccatcgtc ctcatcatca tgttctacat cctgaagaca aagccctctg 120
ccccag 126

<210> 107
<211> 96
<212> DNA
<213> Homo sapiens

<400> 107
gtgacggccc ccatgcgccg gtgccctgcc tcctggactc tccgtcaact ccccctgtcg 60
gagagcctgg ctgctcactc cctcctctct ccccag 96

<210> 108
<211> 75
<212> DNA
<213> Homo sapiens

<400> 108
cctgttgcac cagccacccg gggaagagcg tggaggccca agtgagcaag gacgaggaga 60
agaaagaggc cccag 75

<210> 109
<211> 243
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(243)
<223> n represents a, c, t, or g.

<400> 109
gtctgtgaac cagggcttcc acacaccatg tgcacggtgc ccatctctgg gtggagggcg 60
ttcccagaag cagcctcctc gctgcttctg ctctcacatg ctgaaccata ctgtgcttac 120
cgtggggtgg tgccacacag acaccgggca gctctgccca acaggaagag cagggttggg 180
ctgagcgcan agccatgagc caattctaac tcctatctcc ccaacctccc catttccctg 240
cag 243

<210> 110
<211> 73
<212> DNA
<213> Homo sapiens

<400> 110
acaacgtggt gatgttctcc gagaaggatg aatttgagaa gctgacagca acttcagcaa 60
agcccaccaa gag 73

<210> 111
<211> 1174
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(1174)
<223> n represents a, c, t, or g.

<400> 111
gtatgtggaa gcccccacac caagctgaac tggggtcctg tggatcctga gcagggaggg 60
gttnccaggg tgcagccgag tgaactgaca ggctagcctg ggacactatg gggacgttcg 120
gcgacagaca gtccccacca cctctttgct gactggcagg ggtcaggtgg tgtgaggagc 180
ctgtggaaac agctgcctgc tgctctcggg tcaggcccct gtccctgcat cctgccaaat 240
tccctgggcc ttcctcctta acatccgaat tcctcatgcc ccttctccag actgggaggg 300
cagaacataa agccaaggat gcatgcctgt tgcggccaac acaccagtac cacccgtgcc 360
ggtgccagta ctgctgccac cgtaatgctg gtaacaaccg tggtgatgac ggctaacagc 420
atttggtgcc tactgcccac caagtgctgg gctagggctg tgaacacatc ctnccttcca 480
ccagcccang agcaaggtgc ttggaatcat ccctggttat aggaatacca cactgaggta 540
tggaagttgt cactcgccca aagtcacaca ctagtgaaca canggcttgg ggtccgaagt 600
ccangctccc aangagccac atggngntaa anaggtnagn cagggtcacc cccctaagtt 660
ccaagagggg ggcttttcna ggcacaaagg gttccattna ggttcccttt tcaatgnctt 720

ccagagagcc agcatggatt tcagcgccag cngcatccaa tctgtttgct ttaacatgaa 780
gacaccagtt gaacttgggt gcttactggg attaaataca gagatctagg acatattcaa 840
tgaaccttca cggagcatcc attgtgtgtc aggtagcagg gaaggagagg cccgtggatg 900
cctcccaccc gcagtggcag ccccagcccc ttagacgcct gcaggtcacc caccacggac 960
ttgtttgttt ggaaagaagc aggaagccac cggtgtatgt ctcgtctcat gtcccctggt 1020
cccgtgccca caaggtgccc agtaaacacc tgaaaaacaa gtcattgccc cccactgtcc 1080
acagctgggc aatggacaag ttcaccacag gagaacttgt cagggctgca gccccccag 1140
gcactgctaa tgaccatcgc tcttgttttt gcag 1174

<210> 112
<211> 160
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(160)
<223> n represents a, c, t, or g.

<400> 112
cgagaacgat gcctcatcng agaatgagca gctgctgagc cggagcgtcg acagtgatga 60
ggagcccgcc cctgacaagc agggctcccc ggagctgtgc ctgctgtcgc tggttcacct 120
ggccagggag aagtctgcca ccagcaacaa gtcagccggg 160

<210> 113
<211> 226
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(226)
<223> n represents a, c, t, or g.

<400> 113
gtgaggctcc tgcaggtgcc atgatgagct gtgagatgtg gctccctcac agccgcaagg 60
actaaaactt tcttattgaa tcagctctcc tgcaagacgg ggtgtttctc ccagaagtcc 120
aagataggag acctggacag tgacaagttc acagcaagat agtcaaaagg gaaaaaaacc 180
ctttcgtttt tgagttttgt ttttttttta ggngatgana gnctng 226

<210> 114
<211> 61
<212> DNA
<213> Homo sapiens

<400> 114
attcaaagcc ggaggaaaaa gatcctcgat gtgtatgcca acgtgtgtgg agtcgtggaa 60
g 61

<210> 115
<211> 309
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(309)

<223> n represents a, c, t, or g.

<400> 115
agagtggnng aagagngaag ggaggngaaa agggggngag ngagggaagg aggngggaan 60
nnggagtgag ggggggaagg ggnagagngg gnggnagngn gnggngagng gganagngaa 120
agnagtgaga ngggaaggna nagngagnag gggnnangag aaagngggag ngtaggnggc 180
gatgngnnng gtngaaatat tnanagaaat tttttcaaat aatttttatt tcatttaaat 240
aatttttcag tgttgacctt ctattgactg tgacttgcaa catctaactg tggccattgg 300
tgtctgtag 309

<210> 116
<211> 2781
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)..(2781)
<223> n represents a, c, t, or g.

<400> 116
gtcttagccc cacggagctg ccatttgatt gcctcgagaa gactagccga atgctcagct 60
ccacgtacaa ctctgagaag gctgttgtga aaacgtggcg ccacctcgcc gagagcttcg 120
gcctgaagag ggatgagatt gggggcatga cagacggcat gcaactcttt gaccgcatca 180
gcacggcagg ctacagcatc cctgagctac tcacaaaact ggtgcagatt gagcggctgg 240
atgctgtgga gtccttgtgt gcagacatac tggagtgggc gggggttgtg ccacctgcct 300
cccagccaca tgctgcatcc tgaaaagcat gcctgtgggc tgtcctccca ggacaagcca 360
aggatccaac gagggctctg gagctgtgag tggtgccaaa agactgccaa gaatcaaggc 420
ttttgtgata tgtcaccgta tgccttagga tgttcaagga gccagacgaa ataaggcctg 480
tcttccaatt taaccaaaga taaaggacta gagccgggat actttcanat gctcgcctgt 540
acctcaccag gcagagtaaa tatctactca ctcatacagc cagcccacca gcccaccatt 600
aactcactga acaatgagac aatgtngagg actcaaatga atcaaacccc gtgggaatga 660
cagantgaag aatctggtcc ctgtctttaa ggagtttgca ctccagtaga agacagaagg 720
aacgtatgtt tacaaaccac ttcactggaa gacgtcaaac aagctgaatg aaggggcgct 780
tagaaaacgt taatagaagt tctaagcggg agatgactcc ctactgggat gatgaaggat 840
ggcatcctag tgaagaagca gctcaaacat tttgataaaa tggcaacaaa atgcagacac 900
cctgctccag gtattatttc aggtttagta caagtctgtt aataccctat gtggtttcat 960
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acgcataatt ctagatttca agagcatcta agacttgtgg attagcctca tggcatgaga 1380
gtttcagact cagccttctg agccagtcag ggaaagtgga gttctgcagc gcaaatgaga 1440
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cctctctctg cctcagtttc tcgtctgcca atgagatgtt agttagtgat tctataattg 1560
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agagctcagg agccaggcta gtgatcacac caggggttag agttcactgc tgaactccct 1860
gatggcaggt ctgtgtttat tactacatta aaacaaagtc tctgacttat aaagcgaggt 1920
cgtaaaaatt acaagttgca tgactgaaaa aatgctttag ggggaaaatc agtcatatct 1980
ttaacaccaa caagcaattt cccaccaacg aatgtagtac atactgtgag aggatcataa 2040
tgaggtcctg aatatttaat atcatcattt actgtgtctg tttgctgctg tttttcgaac 2100
ctatttggtt taccctgcaa gctaaatact ccacggcaga ncttaattat ccttttaatt 2160
cctctttgaa atcctgtggt gccccccttcc ccctgccttg tgatgatgat gagtgagtct 2220
ccccttaatt agactgcaaa tgtcacttgt gatgagtgtg ccattccagg ataacagctt 2280
gcaccctcct cagaatgttt tcagcgaaag agtggggtgg ctgttctctg ctcctggtgc 2340

tttggcctca tttcacacta ttagaattct ggggctgtaa ggccagccag tgtcagctca 2400
tgttccattg gctctccacc tgccattttt agggagctat tccttatata gttacaaatt 2460
cccttgtcat ttacttattt ggaaacatgg gatttactct gacaagcttt agcctatgtt 2520
atgggattca gaacaatgag atcataataa ttctcactga ccaaagctgg gactccatcc 2580
tgccattttt gtgtggagat attcataatt ctgcaatact ttaaaacatt tagaaaacac 2640
cccagggtag gtctgtggcc cttanacagt gaaagtctta attggcaata ttatttttgc 2700
taattctgga tatatataac nnattatatt tataaatctc aataaacccc atttantaaa 2760
aaaaaaaaaa aaaaaaaaaa a 2781

<210> 117
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnosis ED.

<400> 117
aaaaagtaac actgatccta ttt 23

<210> 118
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primers that can be used to
diagnosis ED.

<400> 118
agaaagcagg acctcctgg 19

<210> 119
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primer that can be used to amplify
TNF homology domain of mouse dl.

<400> 119
ggattccagg aacaactgtt atgg 24

<210> 120
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primer that can be used to amplify
TNF homology domain of mouse dl.

<400> 120
cctacacaca gcaagcacct tagag 25

<210> 121
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primer that can be used to amplify
TNF homology domain of mouse dl.

<400> 121
gtcgacgaaa atcagccagc tg 22

<210> 122
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
Oligonucleotide primer that can be used to amplify
TNF homology domain of mouse dl.

<400> 122
aagcttctag gatgcagggg c 21